

## REMARKS

Claims 1-5, 8-12, 15-20, and 25-26 are currently pending. Claims 6-7, 13-14, and 21-24 were previously canceled. The Office Action rejects Claims 1-5, 8-12, 15-20, and 25-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. App. Pub. No. 2004/0076247 to Barak et al. ("Barak") in view of U.S. Pat. No. 6,308,562 to Abdallah et al. ("Abdallah").

As set forth in the above listing of amended claims, Applicants have made clarifying amendments to several claims in order to more particularly and distinctly claim embodiments of the invention. These amendments are fully supported by the originally filed specification. Claims 2, 9, 19, and 20 have been canceled. New Claims 27-32 have been added and are fully supported by the originally filed specification.

### The Rejection of Independent Claims 1, 8, 15, 17, and 18 under §103(a) is Overcome

Amended independent Claim 1 is directed to a method comprising generating a residual signal from a multicarrier signal. The residual signal represents a difference between the multicarrier signal and a hard-clipped multicarrier signal. The method further comprises applying a least squares function to the residual signal for at least one carrier of the multicarrier signal, thereby generating a minimized residual signal for each of the at least one carrier. The method also comprises filtering the minimized residual signals. The method additionally comprises combining the filtered minimized residual signals and the multicarrier signal. Independent Claims 8, 15, 17, and 18 recite substantially similar features insofar as this discussion is concerned and are directed to an apparatus, system, apparatus, and system, respectively.

The Office Action alleges that the independent claims (Claims 1, 8, 15, 17, and 18) are unpatentable over the combination of Barak and Abdallah. Applicants respectfully disagree with the position of the Office. In this regard, Barak and Abdallah are not properly combinable. More particularly, Barak is directed to a peak-to-average power ratio modifier for enhancing efficiency of a base station transmitter. *See, for example*, Abstract and FIG. 1 of Barak. In contrast, Abdallah is directed to a mud pulse

telemetry adaptive noise canceler for employment in petroleum drilling operations to analyze information about the drilling operation by monitoring drilling mud flow. *See, for example*, col. 1, line 11 – col. 2, line 32 of Abdallah. As such, the disclosure of Abdallah is not even in the same field as Barak and a person having ordinary skill in the art of mobile communications would not be motivated to modify Barak by any teaching of Abdallah, which is directed to petroleum drilling telemetry. Accordingly, the combination of Barak and Abdallah is improper. Therefore, since the Office admits that Barak does not disclose each feature of the independent claims, the rejection of the independent claims is overcome.

Moreover, even assuming *in arguendo* that the combination of Barak and Abdallah were proper, Abdallah does not cure the admitted deficiencies of Barak. In this regard, the Office admits that Barak does not disclose application of a least squares function to the residual signal for at least one carrier to generate a minimized residual signal. The Office alleges instead that Abdallah teaches this feature. However, Abdallah merely discloses calculating coefficients using a recursive least squares module based upon an  $e(k)$  signal. *See*, col. 7, lines 24-26 and col. 8, lines 15-19 of Abdallah. As such, Abdallah does not teach or suggest applying a least squares function to a residual signal representing a difference between a multicarrier signal and a hard-clipped multicarrier signal, as recited by the independent claims. Accordingly, even if the combination of Barak and Abdallah were proper, the combination fails to teach or suggest each feature of the independent claims, such that the independent claims are patentably distinct from Barak and Abdallah, whether taken alone or in combination.

Nevertheless, in spite of the impropriety of the combination of Barak and Abdallah and the failure of the combination of Barak and Abdallah, even if proper, to teach or suggest each feature of the independent claims, Applicants have amended the independent claims to clarify that the minimized residual signals generated by application of the least squares function is filtered and the filtered minimized residual signals are combined with the multicarrier signal. This added feature was substantially similarly recited in now-canceled Claim 2. Applicants note that the Office alleged that Barak disclosed the feature of Claim 2. However, this allegation was clearly improper, as the

Office misinterpreted the claim scope. In this regard, the Office alleges that the filter 34 and corresponding disclosure of paragraph 49 of Barak teaches both applying a function to the residual signal to generate a minimized residual signal and filtering the minimized residual signals (e.g., two separate operations). This allegation is not proper, as Claim 2 recited and indeed the amended independent claims clarify that the minimized residual signals generated by application of the least squares function are filtered. Therefore, the filter 34 and filtering description taught by Barak cannot disclose both generation of a minimized residual signal and filtering the minimized residual signals, because at most Barak discloses inputting a difference signal to a filter 34 (i.e., a single operation). *See*, paragraph 49 of Barak. Applicants further respectfully submit that the Office has misconstrued the feature of applying a least squares function to the residual signal to generate a minimized residual signal by asserting that any disclosure of applying a filtering function to a difference signal corresponds to applying a least squares function to the residual signal. *See*, page 3 of the Office Action, where the Office posits that Barak teaches “applying a filtering function to the residual signal.”

Moreover, none of the other cited references, taken alone or in combination with Barak, teach or suggest that the minimized residual signals generated by application of the least squares function is filtered and the filtered minimized residual signals are combined with the multicarrier signal. Applicants therefore respectfully submit that the independent claims are patentably distinct from the cited references, taken alone or in combination, such that the rejection is overcome. Applicants further respectfully submit that the independent claims are in condition for allowance.

#### The Rejection of the Dependent Claims is Overcome

Because each of the dependent claims includes each of the recitations of a respective independent base claim, Applicants further submit that the dependent claims are patentably distinguishable from the cited references, taken alone or in combination, for at least those reasons discussed above. Accordingly, Applicants respectfully submit that the rejections of the dependent claims are overcome and the dependent claims are in condition for allowance.

New Claims 27-32 are in Condition for Allowance

As already submitted, each of new Claims 27-32 is fully supported by the originally filed specification. Claims 27 and 28 depend from Claim 1 and thus are in condition for allowance for at least those reasons argued with respect to Claim 1. Claim 29 is directed to an apparatus and recites features substantially similar to those recited in Claim 1. As such, Claim 29 is in condition for allowance for at least those reasons as were discussed with respect to Claim 1. Claims 30-32 each depend from Claim 29 and thus are allowable for at least the same reasons as is Claim 29.

In addition, Applicants submit with particularity that Claim 27 is further patentably distinguishable from the cited references. In this regard, Claim 27 recites that combining the filtered minimized residual signals and the multicarrier signal comprise adding the filtered minimized residual signals to the multicarrier signal. *See*, paragraph 48 of the application. The Office submits that paragraph 50 of Barack, which is alleged to teach the filtered difference signal is subtracted from the input signal (page 3 of the Office Action), teaches combining the minimized residual signals and the multicarrier signal. Clearly, this teaches away from combining by adding the filtered minimized residual signals to the multicarrier signal.

Further, Claim 28 recites that generating a minimized residual signal for each of the at least one carrier comprises generating a set of impulse vectors. The number of impulse vectors in the set is recited to correspond to the number of carriers in the multicarrier signal. *See*, paragraph 53 of the application. None of the cited references, taken alone or in combination, teach or suggest this feature.

### CONCLUSION

In view of the amended claims and remarks presented above, it is respectfully submitted that all of the present claims of the present application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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